



Nemko Test Report: 10210195RUS1

Applicant: Genie Company
P. O. Box 67
Mt. Hope, OH 44660
USA

Equipment Under Test: The Genie Company Model: GK
(E.U.T.) Overhead Door Corporation Model: OKP

In Accordance With: **FCC Part 15, Subpart C**
For Low Power Transmitters Operating Periodically
In The Band 40.66 - 40.77 MHz And Above 70 MHz

Tested By: Nemko USA, Inc.
802 N. Kealy
Lewisville, TX 75057-3136

TESTED BY: Brian Boyea **DATE:** May 27, 2011
Brian Boyea, EMC Engineer

APPROVED BY: David Light **DATE:** December 19, 2012
David Light, Senior Wireless Engineer

Total Number of Pages: 23

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Section 1. Summary of Test Results

Manufacturer: Genie Company

Model No.: The Genie Company Model: GK
Overhead Door Corporation Model: OKPGeneral: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C, Paragraph 15.231. All tests were conducted using measurement procedure ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.



New Submission



Production Unit



Class II Permissive Change



Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See " Summary of Test Data".



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Summary Of Test Data

Name of Test	Paragraph No.	Results
Transmission Requirements	15.231(a)	Complies
Radiated Emissions	15.231(b)	Complies
Occupied Bandwidth	15.231(c)	Complies
Frequency Tolerance	15.231(d)	NA
Alternate Field Strength Requirements	15.231(e)	NA
Powerline Conducted Emissions	15.207	NA

Footnotes:

- 1) The device does not operate between 40.66 to 40.70 MHz
- 2) The device does not operate at a periodic rate.
- 3) The device is battery powered.

Models GK and OKP are identical. The only difference being the brand marketed. Model GK is marketed under the Genie brand while OKP is marketed under Overhead Door brand.

Section 2. Equipment Under Test (E.U.T.)

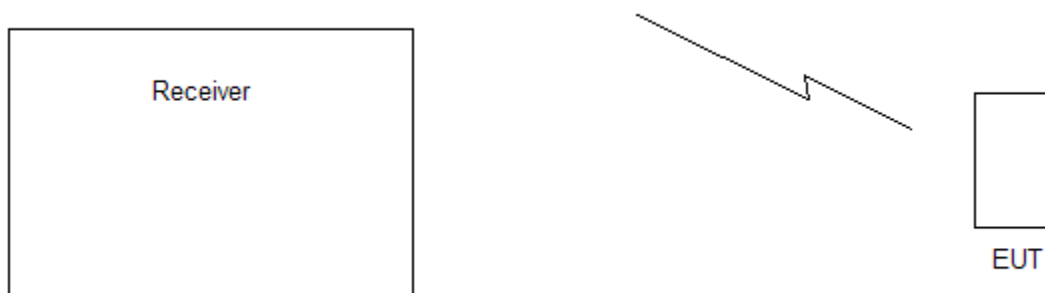
General Equipment Information

Frequency Range:	315 and 390 MHz
Operating Frequency(ies) of Sample:	315 and 390 MHz
Type of Emission:	OOK
Supply Power Requirement:	3 Vdc (2 AAA batteries)

Description of E.U.T.

Wall Mounted Wireless Remote Control Transmitter for Operation of Garage Door Openers

System Diagram



Section 3. Transmission Requirements

NAME OF TEST: Transmission Requirements	PARA. NO.: 15.231(a)
TESTED BY: Brian Boyea	DATE: 31 May 2011

- Minimum Standard:** 15.231(a) Continuous transmissions such as voice, video or data transmissions are not permitted.
- 15.231(a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds after being released.
- 15.231(a)(2) A transmitter activated automatically shall cease transmission within 5 seconds of activation.
- 15.231(a)(3) Periodic transmissions at regular pre-determined intervals are not permitted. However polling or supervisory transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.
- 15.231(a)(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm.

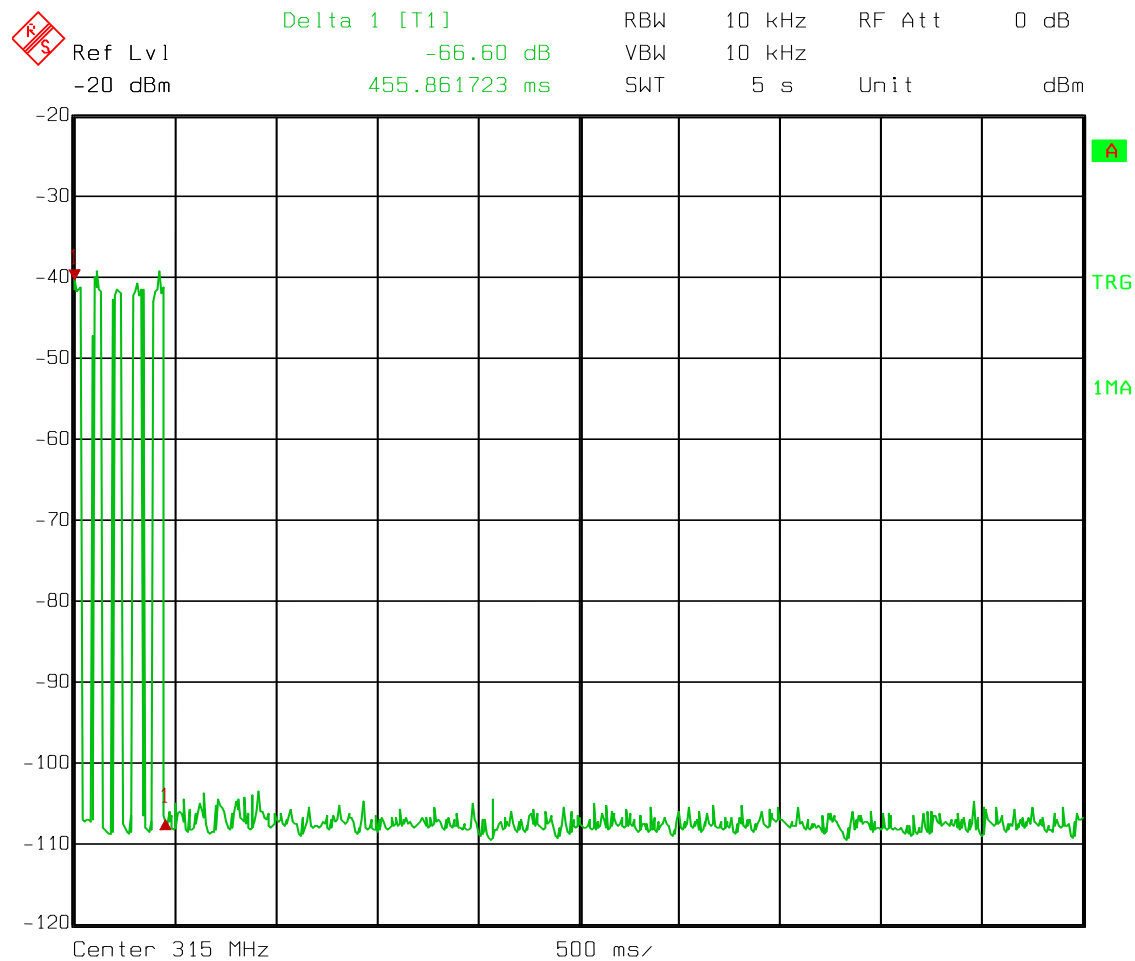
Test Results: [Complies.](#)

Test Data: [Compliance was determined by verification of technical specifications and a functional test on the equipment.](#)

Rationale for Compliance with Transmission Requirements

15.231(a)(1)	<input checked="" type="checkbox"/> Manual activation	TX deactivation time:
15.231(a)(2) :	<input type="checkbox"/> Automatic activation	
15.231(a)(3) :	<input type="checkbox"/> Regular, predetermined transmissions <input type="checkbox"/> Polling or supervisory transmissions	TX rate and duration:
15.231(a)(4) :	<input type="checkbox"/> Alarm device operating during the pendency of alarm condition	
	<input checked="" type="checkbox"/> Non-alarm device	

Test Data – Transmission Requirements – Transmitter Shut Off Time



Date: 31.MAY 2011 15:06:39

Section 4. Radiated Emissions

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.231(b)
TESTED BY: Brian Boyea	DATE: 27 May 2011

Minimum Standard:

Permissible Field Strength Limits (Momentarily Operated Devices)

Fundamental Frequency (MHz)	Field Strength of Fundamental Microvolts/Meter at 3 meters; (watts)	Field Strength of Unwanted Emissions Microvolts/Meter at 3 meters; (watts)
40.66 - 40.70	2,250	225
70-130	1, 250	125
130-174	1,250 to 3,750*	125 to 375
174-260 (note 1)	3,750	375
260-470 (note 1)	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

Notes:

# Use quasi-peak or averaging meter.	For 130 - 174 MHz: $FS \text{ (microvolts/m)} = (56.82 \times F) - 6136$
* Linear interpolation with frequency F in MHz	For 260 - 470 MHz: $FS \text{ (microvolts/m)} = (41.67 \times F) - 7083$

Any emissions that fall within the restricted bands of 15.205 shall not exceed the following limits:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

Test Results: Complies. The worst-case emission level is 72.1 dB $\mu\text{V/m}$ @ 3m at 315 MHz. This is 3.5 dB below the specification limit.

Test Data: See attached tables.

Above 1 GHz a spectrum analyzer and low noise amplifier are used to measure emission levels. The spectrum analyzer resolution bandwidth was set to 1 MHz and video bandwidth was 1 MHz.

Test Data - Radiated Emissions**Transmit at 315 MHz – Peak Measurements**

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Duty Cycle (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	Comment
315	H	0.0	67.4	14.2	2.0	0.0	83.6	95.6	-12.0	Pass	Carrier
315	V	0.0	67.9	14.2	2.0	0.0	84.1	95.6	-11.5	Pass	Carrier
630	H	0.0	51.8	19.8	2.8	27.5	46.9	75.6	-28.7	Pass	
630	V	0.0	63.8	19.8	2.8	27.5	58.9	75.6	-16.7	Pass	
945	H	0.0	33.2	24.0	3.5	27.0	33.7	75.6	-41.9	Pass	
945	V	0.0	41.8	24.0	3.5	27.0	42.3	75.6	-33.3	Pass	
1260	H	0.0	55.5	25.6	3.5	30.9	53.7	75.6	-21.9	Pass	
1260	V	0.0	60.2	25.6	3.5	30.9	58.4	75.6	-17.2	Pass	
1575	H	0.0	48.5	25.6	3.7	32.0	45.8	74.0	-28.2	Pass	
1575	V	0.0	47.2	25.6	3.7	32.0	44.5	74.0	-29.5	Pass	
1890	H	0.0	38.4	28.4	4.3	32.0	39.1	75.6	-36.5	Pass	
1890	V	0.0	40.9	28.4	4.3	32.0	41.6	75.6	-34.0	Pass	
2205	H	0.0	32.8	28.7	5.6	32.3	34.8	74.0	-39.2	Pass	
2205	V	0.0	32.8	28.7	5.6	32.3	34.8	74.0	-39.2	Pass	
2520	H	0.0	41.6	28.8	5.7	33.0	43.1	75.6	-32.5	Pass	
2520	V	0.0	40.0	28.8	5.7	33.0	41.5	75.6	-34.1	Pass	
2835	H	0.0	36.9	29.8	6.4	32.6	40.5	74.0	-33.5	Pass	
2835	V	0.0	40.3	29.8	6.4	32.6	43.9	74.0	-30.1	Pass	
3150	H	0.0	32.4	31.6	6.5	32.7	37.8	75.6	-37.8	Pass	
3150	V	0.0	31.9	31.6	6.5	32.7	37.3	75.6	-38.3	Pass	

The spectrum was searched from to the 10th harmonic of the carrier.

Analyzer Settings:

<1000 MHz RBW/VBW = 100 kHz Peak detector

>1000 MHz RBW/VBW = 1 MHz Peak detector

Test Data - Radiated Emissions

Transmit at 315 MHz – Average Measurements

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Duty Cycle (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	Comment
315	H	-12.0	67.4	14.2	2.0	0.0	71.6	75.6	-4.0	Pass	Carrier
315	V	-12.0	67.9	14.2	2.0	0.0	72.1	75.6	-3.5	Pass	Carrier
630	H	-12.0	51.8	19.8	2.8	27.5	34.9	55.6	-20.7	Pass	
630	V	-12.0	63.8	19.8	2.8	27.5	46.9	55.6	-8.7	Pass	
945	H	-12.0	33.2	24.0	3.5	27.0	21.7	55.6	-33.9	Pass	
945	V	-12.0	41.8	24.0	3.5	27.0	30.3	55.6	-25.3	Pass	
1260	H	-12.0	55.5	25.6	3.5	30.9	41.7	55.6	-13.9	Pass	
1260	V	-12.0	60.2	25.6	3.5	30.9	46.4	55.6	-9.2	Pass	
1575	H	-12.0	48.5	25.6	3.7	32.0	33.8	54.0	-20.2	Pass	
1575	V	-12.0	47.2	25.6	3.7	32.0	32.5	54.0	-21.5	Pass	
1890	H	-12.0	38.4	28.4	4.3	32.0	27.1	55.6	-28.5	Pass	
1890	V	-12.0	40.9	28.4	4.3	32.0	29.6	55.6	-26.0	Pass	
2205	H	-12.0	32.8	28.7	5.6	32.3	22.8	54.0	-31.2	Pass	
2205	V	-12.0	32.8	28.7	5.6	32.3	22.8	54.0	-31.2	Pass	
2520	H	-12.0	41.6	28.8	5.7	33.0	31.1	55.6	-24.5	Pass	
2520	V	-12.0	40.0	28.8	5.7	33.0	29.5	55.6	-26.1	Pass	
2835	H	-12.0	36.9	29.8	6.4	32.6	28.5	54.0	-25.5	Pass	
2835	V	-12.0	40.3	29.8	6.4	32.6	31.9	54.0	-22.1	Pass	
3150	H	-12.0	32.4	31.6	6.5	32.7	25.8	55.6	-29.8	Pass	
3150	V	-12.0	31.9	31.6	6.5	32.7	25.3	55.6	-30.3	Pass	

Test Data - Radiated Emissions

Transmit at 390 MHz – Peak Measurements

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Duty Cycle (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	Comment
390	V	0	68.5	16.0	2.2	0.0	86.7	99.2	-12.5	Pass	Carrier
780	V	0	45.8	21.9	3.3	27.3	43.7	79.2	-35.5	Pass	
1170	V	0	51	25.5	3.2	30.9	48.8	74.0	-25.2	Pass	
1560	V	0	57.5	25.7	3.7	32.1	54.8	74.0	-19.2	Pass	
1950	V	0	47.5	28.7	4.2	32.2	48.2	79.2	-31.0	Pass	
2340	V	0	44	28.8	5.4	32.3	45.9	74.0	-28.1	Pass	
2730	V	0	50	29.6	6.4	32.6	53.4	74.0	-20.6	Pass	
3120	V	0	47	31.6	6.4	32.6	52.4	79.2	-26.8	Pass	
3510	V	0	42	32	7.1	32.7	48.4	79.2	-30.8	Pass	
3900	V	0	41.7	32.9	7.7	32.9	49.4	74.0	-24.6	Pass	
390	H	0	63.1	16.0	2.2	0.0	81.3	99.2	-17.9	Pass	Carrier
780	H	0	45.1	21.9	3.3	27.3	43.0	79.2	-36.2	Pass	
1170	H	0	44.3	25.5	3.2	30.9	42.1	74.0	-31.9	Pass	
1560	H	0	59.7	25.7	3.7	32.1	57.0	74.0	-17.0	Pass	
1950	H	0	43.6	28.7	4.2	32.2	44.3	79.2	-34.9	Pass	
2340	H	0	35.8	28.8	5.4	32.3	37.7	74.0	-36.3	Pass	
2730	H	0	49.5	29.6	6.4	32.6	52.9	74.0	-21.1	Pass	
3120	H	0	48.1	31.6	6.4	32.6	53.5	79.2	-25.7	Pass	
3510	H	0	44.3	32	7.1	32.7	50.7	79.2	-28.5	Pass	
3900	H	0	42.4	32.9	7.7	32.9	50.1	74.0	-23.9	Pass	

Test Data - Radiated Emissions

Transmit at 390 MHz – Average Measurements

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Duty Cycle (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	Comment
390	V	-12	68.5	16.0	2.2	0.0	74.7	79.2	-4.5	Pass	Carrier
780	V	-12	45.8	21.9	3.3	27.3	31.7	59.2	-27.5	Pass	
1170	V	-12	51	25.5	3.2	30.9	36.8	54.0	-17.2	Pass	
1560	V	-12	57.5	25.7	3.7	32.1	42.8	54.0	-11.2	Pass	
1950	V	-12	47.5	28.7	4.2	32.2	36.2	59.2	-23.0	Pass	
2340	V	-12	44	28.8	5.4	32.3	33.9	54.0	-20.1	Pass	
2730	V	-12	50	29.6	6.4	32.6	41.4	54.0	-12.6	Pass	
3120	V	-12	47	31.6	6.4	32.6	40.4	59.2	-18.8	Pass	
3510	V	-12	42	32	7.1	32.7	36.4	59.2	-22.8	Pass	
3900	V	-12	41.7	32.9	7.7	32.9	37.4	54.0	-16.6	Pass	
390	H	-12	63.1	16.0	2.2	0.0	69.3	79.2	-9.9	Pass	Carrier
780	H	-12	45.1	21.9	3.3	27.3	31.0	59.2	-28.2	Pass	
1170	H	-12	44.3	25.5	3.2	30.9	30.1	54.0	-23.9	Pass	
1560	H	-12	59.7	25.7	3.7	32.1	45.0	54.0	-9.0	Pass	
1950	H	-12	43.6	28.7	4.2	32.2	32.3	59.2	-26.9	Pass	
2340	H	-12	35.8	28.8	5.4	32.3	25.7	54.0	-28.3	Pass	
2730	H	-12	49.5	29.6	6.4	32.6	40.9	54.0	-13.1	Pass	
3120	H	-12	48.1	31.6	6.4	32.6	41.5	59.2	-17.7	Pass	
3510	H	-12	44.3	32	7.1	32.7	38.7	59.2	-20.5	Pass	
3900	H	-12	42.4	32.9	7.7	32.9	38.1	54.0	-15.9	Pass	

Asset Tag	Description	Manufacturer	Model	Serial #	Last Cal	Next Cal
1016	Preamplifier	Hewlett Packard	8449A	2749A00159	19-Jun-2010	19-Jun-2011
1025	Preamplifier, 25dB	Nemko USA, Inc.	LNA25	399	23-Feb-2011	23-Feb-2012
1061	Filter, Tunable Notch	K&L	3TNF-200/400-N/N	81	N/R	
1304	Antenna, Horn	Electro Metrics	RGA-60	6151	24-Nov-2010	24-Nov-2012
1763	Antenna, Bilog	Schaffner	CBL 6111D	22926	11-Feb-2011	11-Feb-2012
1767	Receiver, EMI Test 20Hz - 26.5 GHz - 150 - +30 dBm LCD	Rohde & Schwartz	ESIB26	837491/0002	01-Dec-2010	01-Dec-2011
1783	Cable Assy,	Nemko	Chamber		04-Oct-2010	04-Oct-2011

Nemko USA, Inc.

FCC PART 15, SUBPART C

PERIODICALLY OPERATED LOW POWER TRANSMITTERS

EQUIPMENT: GK / OKP

PROJECT NO.: **10210195RUS1**

	3m Chamber					
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Duty Cycle Correction**Calculation Of Duty Cycle Limit Reduction
for NGX****DESCRIPTION:**

Total Packet Length or Duration -	100mSec
Short Pulse Duration -	200uSec
Medium Pulse Duration -	300uSec
Long Pulse Duration -	400uSec
Number of Short Pulses/Packet -	36
Number of Medium Pulses/Packet -	12
Number of Long Pulses/Packet -	36
Calculation of Total "On" Time -	36(200uSec) + 12(300uSec) + 36(400uSec) = 25.2mSec
Calculation of Duty Cycle -	=25.2mSec/100mSec = .252
Calculation for Correction for Duty Cycle -	=20log(.252) = -11.97dB

Section 5. Occupied Bandwidth

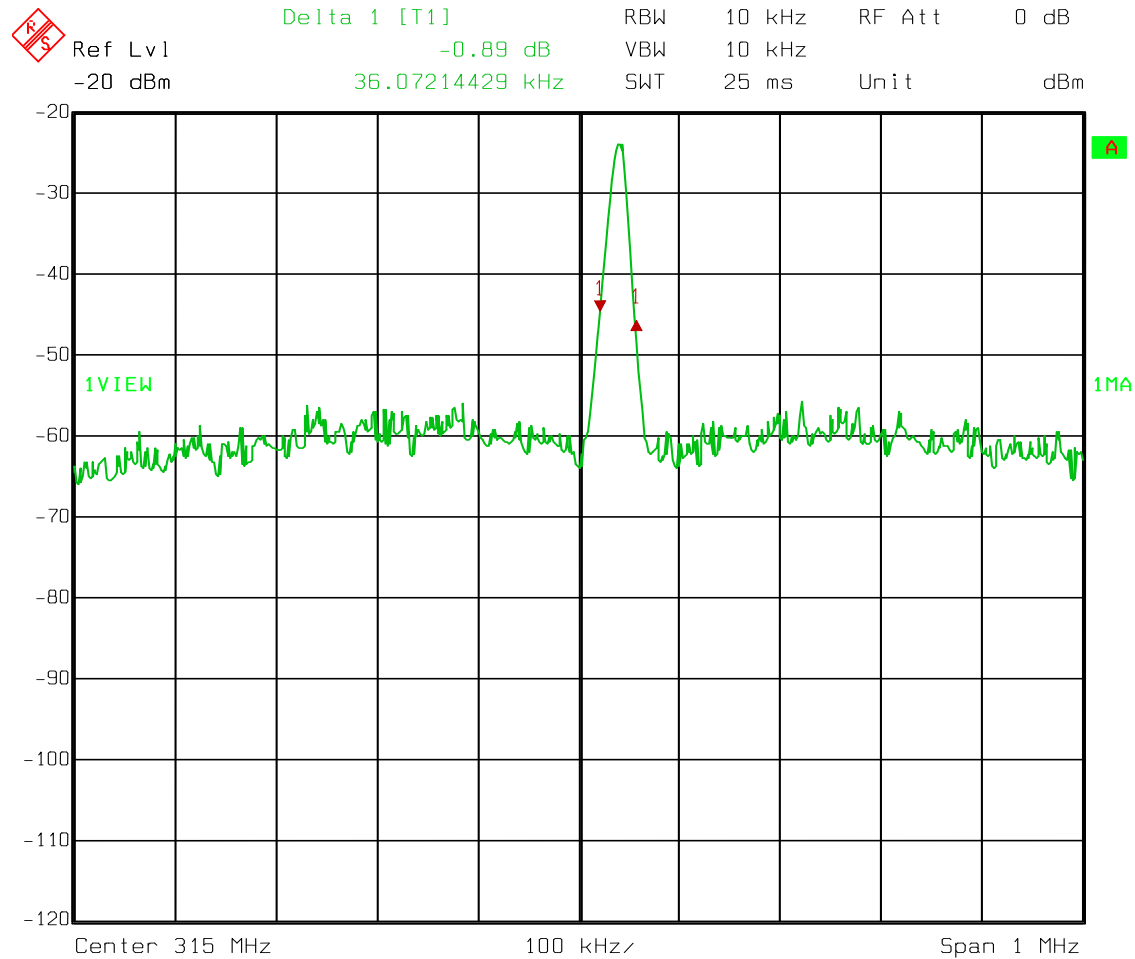
NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.231(c)
TESTED BY: Brian Boyea	DATE: 27 May 2011

Minimum Standard: 15.231(c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

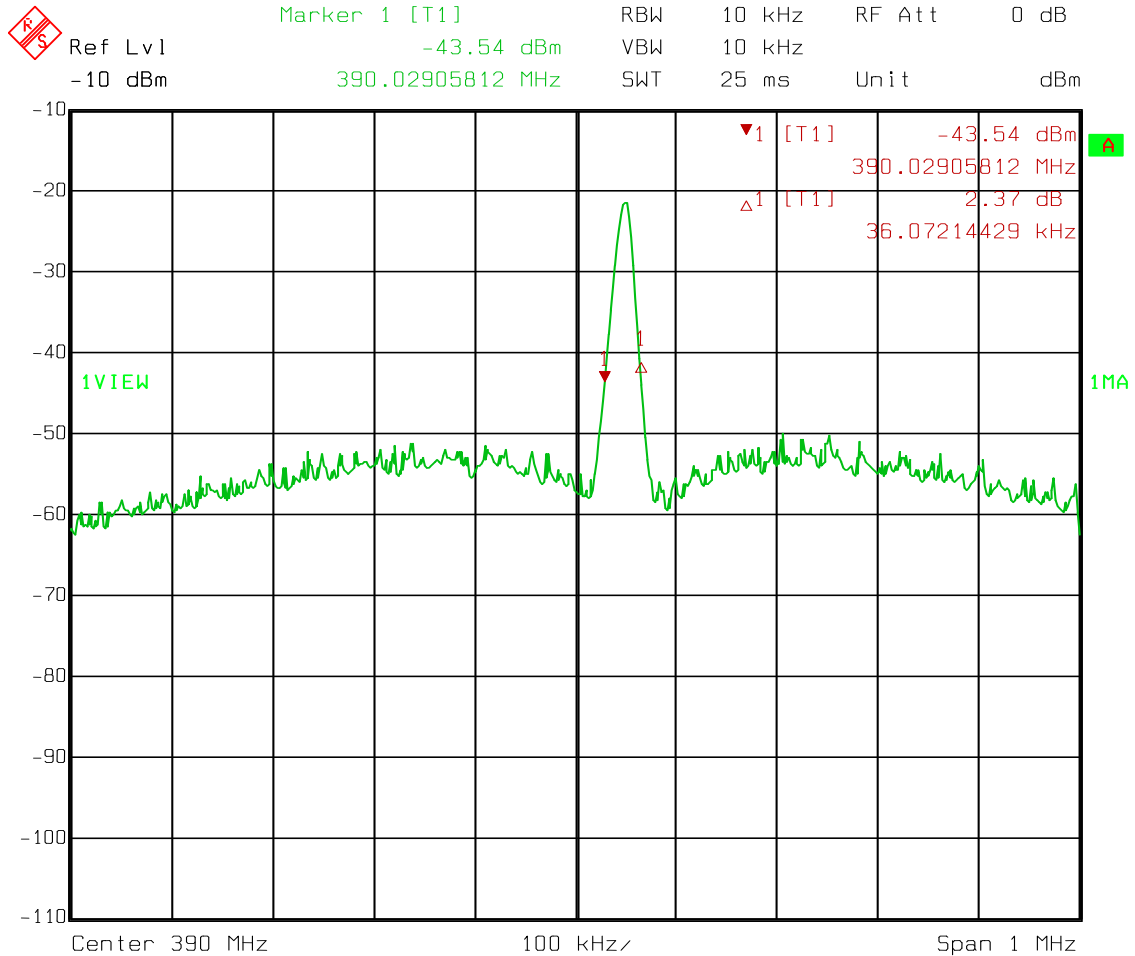
Test Results: Complies. .

Test Data: See attached graph.

Test Data – Occupied Bandwidth

**Limit = 787.5 kHz**

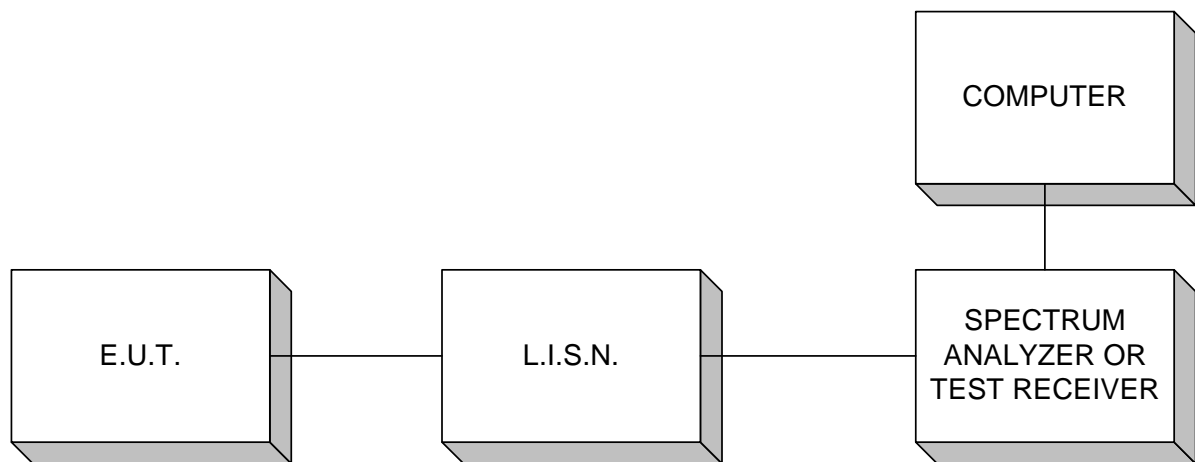
Test Data – Occupied Bandwidth



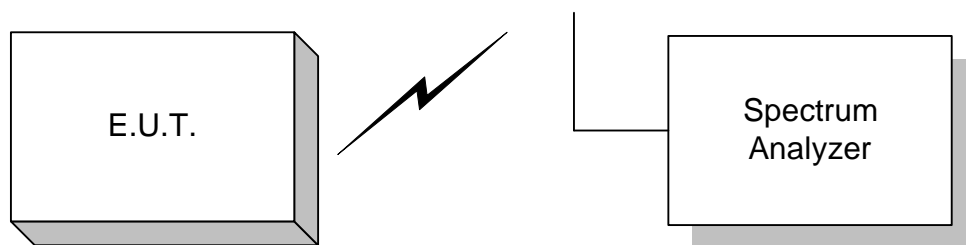
Limit = 975 kHz

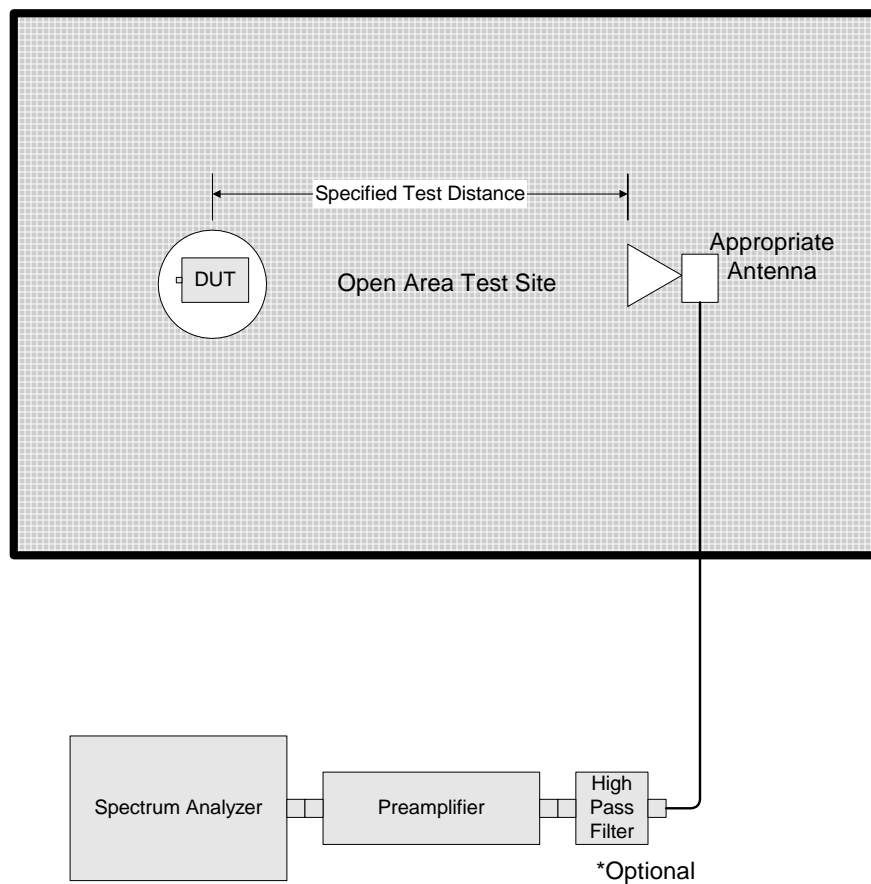
Section 6. Block Diagrams

Conducted Emissions

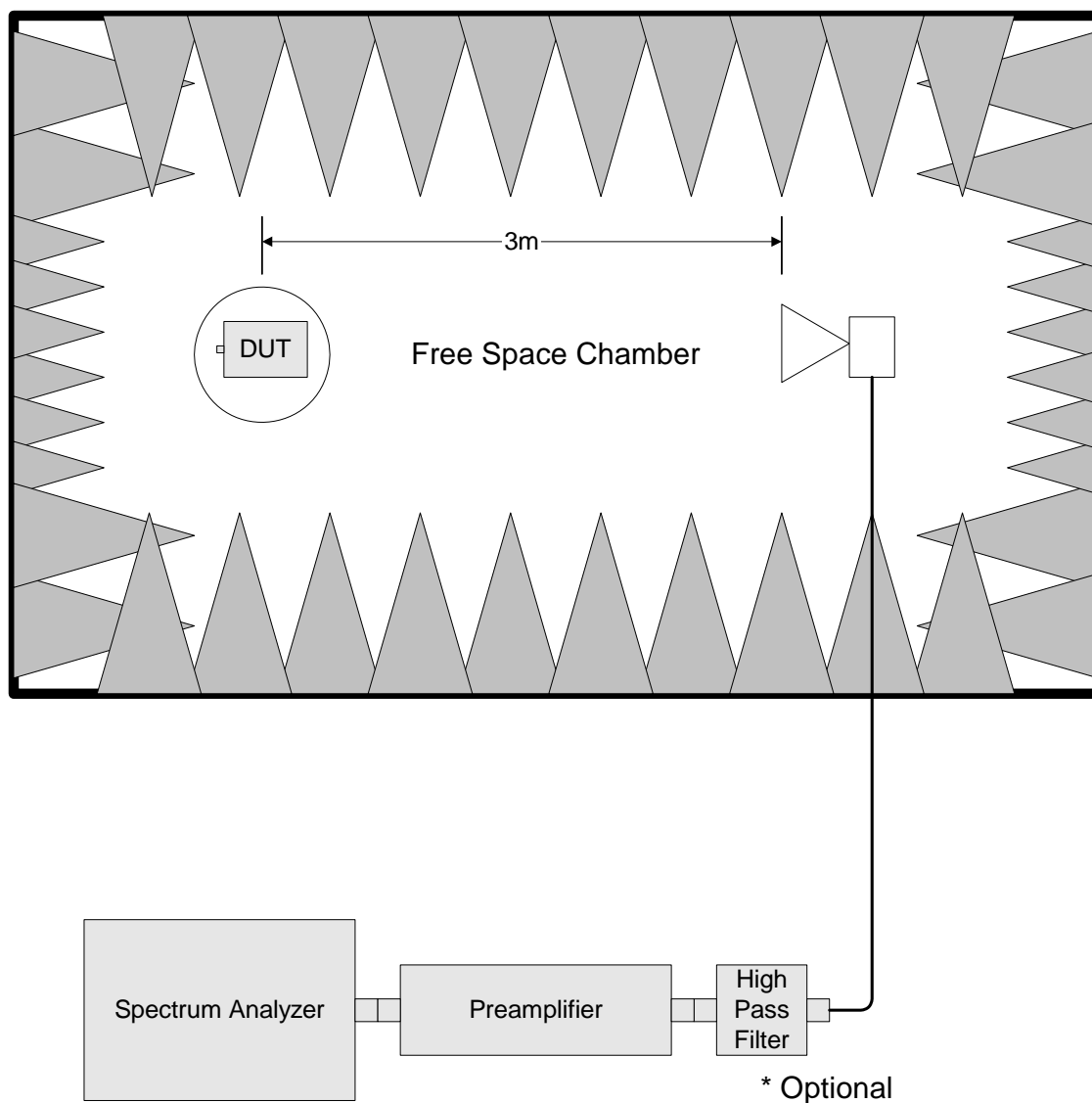


Occupied Bandwidth, Duty Cycle



Outdoor Test Site For Radiated Emissions**Radiated Emissions 30 MHz - 1 GHz**

The spectrum was searched up to the 10th harmonic of the fundamental frequency of operation.



Radiated Emissions above 1 GHz

ANNEX A - RESTRICTED BANDS

Annex A Restricted Bands of Operation

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.15
0.49 - 0.51	16.69475-16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425-16.80475	960-1240	7.25-7.75
3.020 - 3.026	25.5-25.67	1300-1427	8.025-8.5
4.125 - 4.128	37.5-38.25	1435-1626.6	9.0-9.2
4.17725 - 4.17775	73-74.6	1645.5-1646.5	9.3-9.5
4.20725 - 4.20775	74.8-75.2	1660-1710	10.6-12.7
6.215 - 6.218	108-121.94	1718.8-1722.2	13.25-13.4
6.31175 - 6.31225	123-138	2220-2300	14.47-14.5
8.291 - 8.294	149.9-150.05	2310-2390	15.35-16.2
8.362 - 8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625 - 8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425 - 8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29 - 12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975 - 12.52025	240-285	3345.8-3358	36.43-36.5
12.57675 - 12.57725	322-335.4	3600-4400	Above 38.6
13.36 - 13.41			